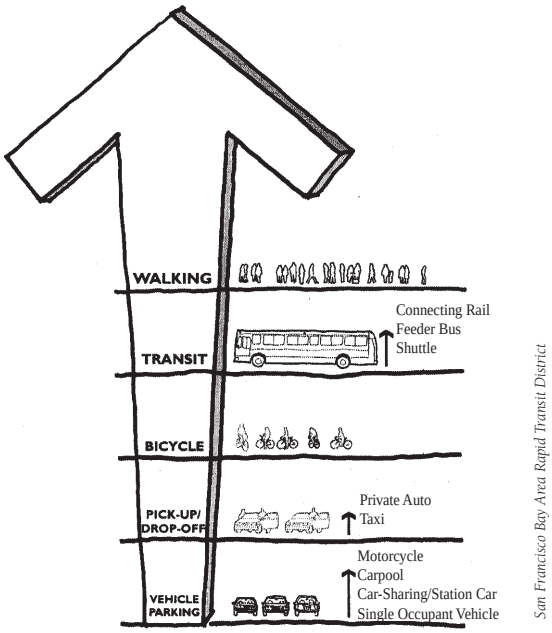
Chapter 4. Providing Access to Transit

Access to Rail Transit Stations

Rail transit includes light rail, heavy rail, commute, and intercity rail services. {[1] "People who catch rail transit are walking, bicycling, driving, and transferring to and from buses. Traffic moves more slowly and parking is a valued commodity. In fact, if the streets and sidewalks are not bustling, then the station area is probably not as vibrant as it could be. Access to the rail transit station should be an extension of the local and regional circulation network that serves the surrounding neighborhood.

According to the figure below, the … priority of modes of access to rail transit stations …[is]:



Access Hierarchy

1. Pedestrian
2. Transit and Shuttles
3. Bicycles
4. Carpool, Cabs and Drop-offs
5. Single-Occupant Automobiles" [1]}

Pedestrian Access to Rail Transit Stations

All people who pass through a rail transit station's faregates are pedestrians, no matter how they got to the station area. Whether on foot or in wheelchairs, pedestrians trying to reach a rail transit station will always seek the shortest route, even when buildings and parking areas block the way to the station, when the roads are wide, and when crosswalks are few and far between. Trampled landscaping, chronic jaywalking and regular circumvention of no-crossing zones and keep-out fences may suggest that the site planning in the station area did not fully consider pedestrians.

Many of these problems can be avoided by giving pedestrians top priority in the rail station area. This means making the area feel safer, more convenient and more human-scaled. Sidewalks and crosswalks that take people where they want to go not only improve pedestrian safety and satisfaction, they reduce long-term maintenance costs. In fact, the 'cow paths' that pedestrians blaze through the station area are good indicators of where they want to go, and are possibly worth formalizing in station area development.

The closer streets get to a rail station area, the more complex and multi-modal they become. Cars, shuttles, bikes and buses share the street with pedestrians, and traffic slows. Certain levels of congestion near the station must be …[expected] and tolerated. The street design near the station should prepare drivers for unexpected, immediate stops. The street and lane width and curb radius [not just speed limit signs] should dictate the travel speeds…

Note: Because of the volume and length of many of the quotations in this document, a bracket symbol with corresponding footnote reference number is placed at the beginning and ending of each quotation.

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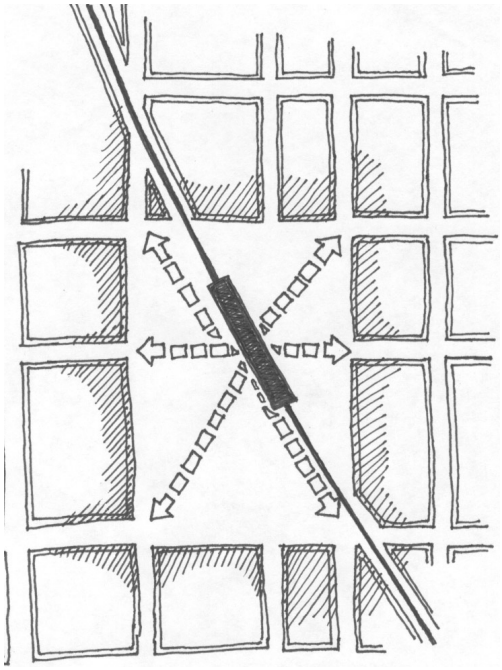
{[2] "Guideline: Sidewalks connecting rail station faregates to key intersections and destinations in the station area should be as short, direct and visually unobstructed as possible.

Guideline: Sidewalks linking rail station faregates to the surrounding community should be wide and smooth enough for wheelchairs and strollers, and lined with trees, lights and wayfinding signs to improve orientation and safety.

Guideline: The size and layout of blocks near rail stations should anticipate the need for direct pedestrian paths.

Guideline: The main sidewalks and crosswalks in the area should not be disrupted by wide turning radii, driveways, garage entrances, and dedicated turning lanes that require pedestrian refuge islands.

Guideline: Street width in the immediate station area should not be wider than needed to accommodate 'design' travel speeds and emergency vehicle egress, and if applicable, any bike and/or parking lanes." [2]}

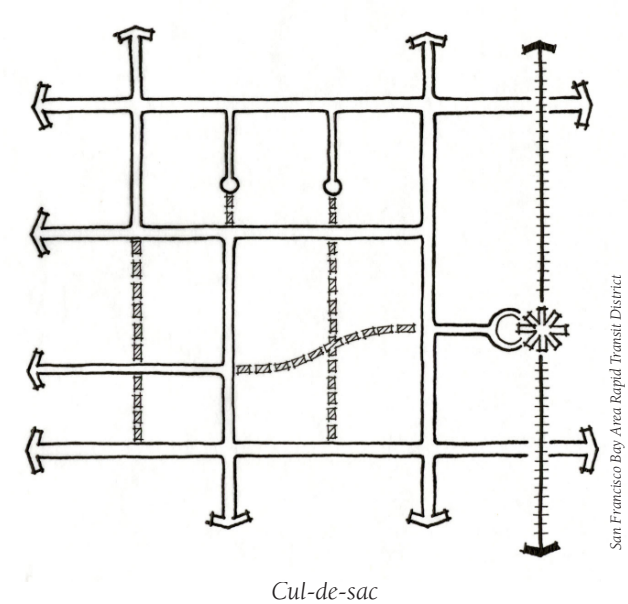


San Francisco Bay Area Rapid Transit District

Pedestrian Pathways

Transit Access to Rail Transit Stations

Rail transit stations are linked to buses, light rail, commuter rail, ferries, cable cars, shuttles and other means of transit. These connections are essential for healthy, growing rail transit ridership. As multi-modal hubs, rail transit stations are also important transfer points between these other transit systems and should accommodate them. Transit-oriented development (TOD) residents and workers may depend on these vital transit services to go places that rail transit does not reach.



San Francisco Bay Area Rapid Transit District

Cul-de-sac

However, bus lanes and loading zones can cause conflicts with other functions in the station area. Land devoted exclusively to bus loading can feel "dead" outside the rush hour. In a TOD, where land is especially valuable and pedestrian activity most intense, the amount of land and street space dedicated to buses should be used as efficiently as possible.

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{3 "Guideline: Transit boarding zones should have, lighting, seating, service information (schedules, maps and monitors), and offer shelter from the elements to promote comfort, security and reliable connections.

Guideline: The link between rail transit and connecting transit should be direct, short and uninterrupted by other types of vehicular traffic.

Guideline: Bus, shuttle and light rail waiting and loading areas should be concentrated to facilitate transit-to-transit connections and to avoid wasting land and creating expansive 'dead' zones.

Bus arriving at a BART station

Bicycle Access to Rail Transit Stations

Bicycles provide access to the station from greater distances than walking, but with fewer impacts than vehicular traffic and parking. However, the mix of vehicular and pedestrian traffic converging at rail transit stations may discourage bike riders. Even though the station itself may provide ample bike accommodations, the streets and paths that lead there should still provide bicyclists with a safe and comfortable approach to the station.

Guideline: Local and regional bike networks should be connected with rail transit stations, marked with signage, and free of any barriers such as curbs and fences.

Guideline: Bicycle parking at rail transit stations should be sheltered, well-lit, secure and highly visible.

Taxi, Pick Up and Drop-Off Zones

Persons getting picked up and dropped off at rail transit stations by taxis or other drivers invariably seek to get as close to the station as possible. Providing space for this activity can be a challenge.

"Good public transportation is as important to the quality of a community as good roads. Well-designed transit routes and accessible stops are essential to a usable system. Bus stops should be located at intervals that are convenient for passengers. The stops should be designed to provide safe and convenient access and should be comfortable places for people to wait. Adequate bus stop signing, lighting, a bus shelter with seating, trash receptacles, and bicycle parking are also desirable features. Bus stops should be highly visible locations where pedestrians can reach them easily by means of accessible travel routes. Therefore, a complete sidewalk system is essential to support a public transportation system."

Federal Highway Administration, "Pedestrian Facilities Users Guide: Providing Safety and Mobility", March 2002

Chapter 4. Providing Access to Transit

This is where pedestrian, bus and automobile circulation is most intense and station area land the most valuable. Still, taxi and drop-off access to rail transit accommodates large volumes of customers more efficiently than drive-and-park access, and cab access is especially important for visitors unfamiliar with other modes.

Guideline: Taxi and pick-up/drop off areas should be signed, well-lit, close to and visible from the station entrance." [3]}

Development-Oriented Bus Facility Design

Site Relationship to Transit Stop

{[4] "The transit stop should be centrally located within the TOD." [4]}

Bus Stop Spacing

{[5] "Bus travel time and schedule reliability are important factors in attracting transit ridership. Too many stops slow bus operations and fail to provide sufficient distance between stops for safe stopping. Too few stops increase walking distances and decrease coverage. Striking a balance between convenient access and safe, timely operation increases bus competitiveness with cars." [5]}

Bus Stop Placement

{[6] "Tri-Met uses the following guidelines as an initial tool for evaluating bus stop placement:

- Avoid unnecessary changes in bus stop locations,
- Identify closest bus stops,
- Ensure compatibility with adjacent properties,
- Allow adequate sight distance,
- Ensure pedestrian linkages and street crossings,
- Provide for adequate bus maneuvering,
- Evaluate travel time delays, and
- Evaluate signalization impacts." [6]}

Chicago Transit Authority

Bus landing

Lane Widths

"Provide a curbside lane width of 12 feet (exclusive of a bike lane) for normal bus operation on a mixed-traffic roadway. Provide curbside lane width of 14 feet along roadway segments where operating speeds and bus frequency are higher or where on-street parking is available adjacent to the travel lane."

Tri-County Metropolitan Transportation District, "Planning and Design for Transit Handbook", January 1996

Chapter 4. Providing Access to Transit

Bus Zones

{[7] "Bus zones are designated no-parking areas on streets with curbside parking. They allow the bus to pull out of the travel lane and up to the curb to stop, boarding and de-boarding all passengers in a way that is safe and not disruptive to other traffic." [7]}

Transit Stop Facilities

{[8] "At a minimum, TOD transit stops shall provide shelter for pedestrians, convenient passenger loading zones, and secure bike storage." [8]}

{[9] "Reasonable levels of weather protection, physical accessibility, and clearly understood transit information are important elements in promoting public use of the transit system." [9]}

Curb Extensions

{[10] "Curb extensions enhance the pedestrian environment by reducing street crossing distances and calming vehicular traffic...they also allow more on-street parking than bus zones do, and they also provide additional space for pedestrian and bus passenger amenities (e.g., shelter or bench, bicycle rack, trash receptacle).

Curb extensions usually are considered appropriate along streets with lower traffic speeds and/or reduced traffic congestion where it is acceptable to stop buses in the travel lanes. Collector streets in neighborhoods and the designated pedestrian districts are also good candidates for such treatment." [10]}

Bus Shelters

{[11] "Tri-Met encourages private developers and other agencies to include passenger shelters as part of new developments when warranted. The most important criteria are as follows:

- Number of passengers boarding per day,
- Type of population served,
- Preparation required, and
- Availability of nearby shelter." [11]}

Parsons Brinckerhoff

Bus shelter

Bus Benches

{[12] "Providing bus benches without shelters is appropriate at some bus stops. Criteria for placing benches without shelters include the following:

- Locations where the regular number of riders does not warrant a shelter.
- Locations with adjacent site features (retaining walls, stairs, low fences) that attract riders onto adjacent property.
- High-use areas due to high levels of pedestrian movement over a small area.
- High ridership locations that have weather protections, but no seating.
- Transfer locations with buses on long headways.
- Locations used by elderly and disabled persons." [12]}

Curb extension

Chapter 4. Providing Access to Transit

Lighting

{[13] "Site lighting is often determined by economies of scale and the particular configuration of a site. For functional reasons, lighting standards are located along the perimeter of the property and at interior locations within larger parking areas. Throughout the Portland region, jurisdictions have recognized the need to incorporate shorter ornamental lighting standards and brighter lighting levels in areas targeted for pedestrian activity. These standards provide the opportunity to focus brighter lighting levels in pedestrian areas, allowing lower levels elsewhere, and add to the legibility of the pedestrian network.

Street lights at San Antonio station in Mountain View

- To distinguish the pedestrian network, provide ornamental lighting no greater than 12 feet in height.
- To ensure pedestrian safety, provide .75 to 1.5 foot-candles of illumination along pedestrian routes and at bus stops.
- Place light posts in buffers between pedestrian pathway and driveways or roadways." [13]}

Bus Landing Areas

{[14] "At a minimum, the Americans with Disabilities Act (ADA) requires that all new and relocated stops have a landing area that meets the following requirements:

Bus landing area near Downtown Plaza in Sacramento

- Provide a 5-foot-wide by 8-foot-wide unobstructed paved landing area for bus lift operation.
- Ensure that the cross-slope of the landing pad does not exceed 2 percent.
- In curbed areas, construct the landing pad of concrete at least 4" in depth. In uncurbed shoulder areas, an asphalt landing pad is acceptable.
- For most buses, locate landing pads one foot from bus stop sign location. For buses with rear door lifts, locate the landing 23.5 feet from the bus stop sign." [14]}

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Bus Stop Delineation

"Proper delineation of a bus stop will discourage general traffic from using the stop area and will direct bus operators where to stop. Delineation might include:

*** Signing and striping the stop as a bus zone,**

*** Identifying the stop through curb markings, and**

*** Additional signage provided by the local jurisdiction."**

Tri-County Metropolitan Transportation District, "Planning and Design for Transit Handbook", January 1996

Roadway Pavement

{[15] "When fully loaded, a standard bus has a rear axle weight of 25,000 pounds (dual tires). With repeated use, substandard roadways will deteriorate." [15]}

- {[16] "On typical roadways with fewer than 25 buses per day, design roadways with typical asphalt pavement sections.
- On roadways carrying 25 or more buses per day, incorporate concrete roadways to avoid the deterioration that typically occurs with asphalt, particularly in bus stopping and turning areas or areas with special soil conditions.
- At bus stops accommodating very high bus volumes, provide a reinforced concrete pad." [16]}

Parsons Brinckerhoff

Reinforced bus roadway

Corner Radii

{[17] "Design curb radii to accommodate bus movements where appropriate. Curb radii may vary from 15 to 50 feet depending on site constraints and desirable operations. Where larger radii are developed, allow longer walk time at signalized intersections to accommodate increased pedestrian crossing distances." [17]}

Obstructions/Clearances

{[18] "Generally, buses travel in the curbside traffic lane and make frequent stops to pick up and drop off passengers. Physical obstructions, such as utility poles and signs, must be set back far enough from the curb to allow space for bus 'tilt' from crowned roadway sections." [18]}

Driveways

{[19] "Provide adequate distance between bus stops and driveways to prevent buses from blocking driveway traffic or sight lines. In constrained situations, buses may block driveways if other access is provided to the property and sight distances are maintained." [19]}

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Catch Basins

{[20] "Bus stops should not be located where a bus wheel will stop on a catch basin or storm drain because that could cause the bus to lurch or change direction. Repeated loading on a catch basin will cause excessive settlement of the basin's structure and could cause difficulty with deployment of a wheelchair lift. Avoid placing catch basins within bus stop zones." [20]}

Bus sign at K Street Mall in Sacramento

Bus Stop Signs

{[21] "Signs are placed to notify passengers where a bus will stop, to provide a reference for bus operators and passengers, and to publicize the system. In placing a bus stop sign, concerns for passenger and public safety, convenience, and bus stop visibility must be addressed." [21]}

Street Grade

{[22] "Evaluate cross-slopes in lanes with bus circulation to avoid roller coaster effects and allow adequate bus lift deployment." [22]}

References

1 *BART Transit-Oriented Development Guidelines*, San Francisco Bay Area Rapid Transit District, June 2003. "BART station" has been changed to "rail transit station" for this Compendium.

2 Ibid.

3 Ibid.

4 Calthorpe Associates in association with Mintier Associates, *Transit Oriented Development Design Guidelines for Sacramento County*, September 1990.

5 Tri-County Metropolitan Transportation District of Oregon, *Planning and Design for Transit Handbook*, January 1996.

6 Ibid.

7 Ibid.

8 Calthorpe Associates in association with Mintier Associates.

9 Tri-County Metropolitan Transportation District of Oregon.

10 Calthorpe Associates in association with Mintier Associates.

11 Tri-County Metropolitan Transportation District.

12 Ibid.

13 Ibid.

14 Ibid.

15 Ibid.

16 Ibid.

17 Ibid.

18 Ibid.

19 Ibid.

20 Ibid.

21 Ibid.

22 Ibid.